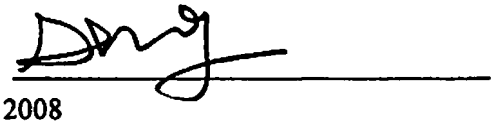
CERTIFICATE OF TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of the Priority Document with respect to the Korean patent application No. **2003-18869 file on March 26, 2003,** which the translation is accurate.

NAME OF THE TRANSLATOR : Seung –Ji Kim

SIGNATURE : 

Date : March 18, 2008

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CITIZENSHIP : REPUBLIC OF KOREA

[ABSTRACT OF THE DISCLOSURE]

[ABSTRACT]

Disclosed is a method of starting an application program of a mobile terminal having a data terminating function, the method comprising the steps of: receiving a call establishment request for data termination; establishing a data call according to the call establishment request; checking the kind of service included in an application program starting message, when the application program starting message is received after the call is established; and automatically starting an application program corresponding to the confirmed kind of service. Therefore, it is possible to automatically invoke an application program capable of processing data terminated to a mobile terminal having a data terminating function.

[REPRESENTATIVE FIGURE]

Fig. 3

[INDEX]

data terminating, starting an application program, message

[SPECIFICATION]

[TITLE OF THE INVENTION]

METHOD FOR ACTING APPLICATION PROGRAM IN MOBILE COMMUNICATION TERMINAL AND METHOD FOR PROVIDING SERVICE DATA IN SERVICE SYSTEM OF MOBILE COMMUNICATION NETWORK

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 is a schematic view illustrating a mobile communication system according to the present invention;

FIG. 2 is a block diagram illustrating a mobile terminal according to the present invention;

FIG. 3 is a view illustrating a software configuration for operating application programs stored in a mobile terminal according to the present invention;

FIG. 4 is a view illustrating a format of an application program starting message, which is used for a server to run an application program stored in a mobile terminal according to the present invention;

FIG. 5 is a control flowchart for explaining an application program starting method of mobile terminal according to the present invention;

FIG. 6 is a flowchart for explaining an internal operation of a server of a mobile communication provider to invoke an application program of a mobile terminal according to a first embodiment of the present invention; and

FIG. 7 is a flowchart for explaining an internal operation of a server of a mobile communication provider to invoke an application program of a mobile terminal according to a second embodiment of the present invention.

* Explanation of the reference numeral of main unit.

1a.1m: mobile communication terminal 2a.2m: base station
3a, 3m; Base Station Controller 4: Mobile Switching Center
7: Packet Network 8: Application Program Starting Server
9: Messenger Service Center 10: mobile terminal
11: Stock Server 12: Advertisement Server

[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]

[RELATED FIELD AND PRIOR ART OF THE INVENTION]

The present invention relates to a mobile terminal, and more particularly to a method of starting an application program of a mobile terminal having a data terminating function.

A mobile terminal ranks highly as a kind of multimedia communication equipment not only having a simple conversation function but also adding a variety of functions such as electric notebooks, MP3 (MPEG-1 Audio Layer 3) players, games, many kinds of information provision, and so forth.

In a conventional mobile terminal, data service has been designed with a prior condition that a terminal sends data. In general, a mobile terminal invokes its browser through a Wap-push service, selects a desired program, and connects to a wireless internet, because there is no data terminating service in the prior art.

Mobile communication services capable of supporting the data terminating function for a mobile terminal include CDMA (Code Division Multiple Access) 2000 EV-DV and IMT-2000 (International Mobile Telecommunications-2000) services.

An asynchronous IMT-2000, which supports a multimedia communication service called the 3rd generation mobile communication, supports the data terminating service. The asynchronous IMT-2000 system is based on the UMTS (Universal Mobile Telecommunication System) standard, which is currently being standardized in the 3GPP (3rd Generation Partnership Project). When data have terminated at a mobile terminal in IMT-2000 system, the call connection process is summarized below. Herein, the subject of origination may be a server existed in a network or may be a terminal such as a computer. When an originating subject sends a data call to a pertinent terminal desired for communication, the pertinent terminal receives a paging signal. In general, the paging signal is indicated as a ring or a vibration according to the setting of the terminal. Subsequently, when a user pushes the send key, being a key to answer a call, on the pertinent terminal, the CPU in the terminal generates a wireless link to transmit/receive data through a call processing program. After this, data outputted from an originating part are transmitted as TCP/IP packets to the terminal of an terminating part.

When the IMT-2000 service as described above is attained, a mobile terminal may be used with a great variety of data application programs such as VOD (Video On

Demand), image communications, advertisement broadcasting, transmission/receipt of massages like an instant message, and so forth. Hence, it is necessary to select and invoke a pertinent program corresponding to a data terminating call.

[TECHNICAL SOLUTION OF PRESENT INVENTION]

Accordingly, the present invention is to provide a method of starting an application program of a mobile terminal so that an application program capable of processing the terminated data is automatically invoked in a mobile terminal having a data terminating function as well as a method of providing service data in a mobile communication system.

[CONSTRUCTION AND OPERATION OF THE INVENTION]

In order to accomplish these objects, there is provided a method of starting an application program of a mobile terminal having a data terminating function, the method comprising the steps of: receiving a call establishment request for data termination; establishing a data call according to the call establishment request; checking the kind of service included in an application program starting message, when the application program starting message is received after the call is established; and automatically starting an application program corresponding to the confirmed kind of service.

In accordance with another aspect of the present invention, there is provided a method of providing service data to a mobile terminal in a mobile communication system, the mobile terminal having a data terminating function, the method comprising the steps of: receiving a request for data transmission to the mobile terminal from at least one service server; generating an application program starting message for running one of at least one application program stored in the mobile terminal on the basis of the kind of service data to be provided from the service server; transmitting a call establishment signal to the mobile terminal, the call establishment signal requesting data termination being for the transmission of the generated application program starting message; transmitting the application program starting message to the mobile terminal through a traffic channel, the traffic channel being formed upon the selection of data termination at the mobile terminal; and the mobile terminal receiving service data of the service server by connecting with the service server.

Hereinafter, a method of starting an application program of a mobile terminal and a method of providing service data in a mobile communication system according to preferred embodiments of the present invention will be described with reference to the accompanying drawings. It is to be noted that the same elements are indicated with the same reference numerals throughout the drawings. In the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

FIG. 1 is a schematic view illustrating a mobile communication system according to the present invention. As shown in FIG. 1, the mobile communication system includes a plurality of mobile terminals 1a to 1m, a mobile communication network supporting wireless communication services to the mobile terminals 1a to 1m, and an application program starting server 8, which is connected with the mobile communication network, providing a variety of services to the mobile terminals 1a to 1m.

The embodiment of the present invention will be described in conditions that the mobile terminals 1a to 1m are mobile terminals for IMT-2000, and the mobile communication network is operated on the basis of UMTS (Universal Mobile Telecommunication System) configuration.

The mobile communication network includes a plurality of base stations 2a to 2m, a plurality of BSCs (Base Station Controllers) 3a to 3m, a MSC (Mobile Switching Center) 4, and GPRS (General Packet Radio Service). The base stations 2a to 2m change signal formats between the mobile terminals 1a to 1m and the BSCs 3a to 3m so as to be suitable for wireless link and wire link. The BSCs 3a to 3m are connected to the base stations 2a to 2m, and perform functions such as base station management, service quality management of hardware/software in the base station, resource allocation and configuration of call traffic, and information collection for base station management. The MSC 4 manages the BSCs 3a to 3m and determines nodes for user traffic either between a mobile communication network and a public switched telephone network or among MSCs in the same mobile communication system. The GPRS is a packet data wireless service for access to internets and data networks in the UMTS (Universal Mobile Telecommunication System) and is provided through a packet network 7. The GPRS uses packet-mode technology to transmit data and signals at high/low speed in the mobile communication network and cooperates with the internet

so as to provide an internet service to the mobile terminal 1a to 1m. The GPRS comprises SGSN (Serving GPRS Support Node) and GGSN (Gateway GPRS Support Node). The SGSN, which is a system undertaking a packet service, functions location management of mobile packet subscribers, authentication, and security management. The GGSN, which is a system supporting IP service, functions to access external networks such as an internet.

An application program starting server 8 is connected to the packet network 7, and functions generation of application program starting messages for mobile terminals according to the present invention. Also, the application program starting server 8 is connected to a plurality of servers for service providers. Herein, the service provider servers includes a messenger service server 9 supporting an interactive message service by an instant message, a stock server 11 in which stock information is accumulated, and an advertisement server 12 in which moving-picture advertisement data are accumulated.

In the application program starting server 8, IP information of the stock server 11 and the advertisement server 12 has been stored under a conference with service providers of the stock server 11 and the advertisement server 12. When receiving a request of data transmission from an originating terminal such as a mobile terminal, a computer, or so forth, the application program starting server 8 generates an application program starting message, and transmits the application program starting message to a receiving terminal. Herein, the originating terminal may be an advertisement server 12 itself which transmits advertisement data to a mobile terminal through the mobile communication network and the packet network.

FIG. 2 is a block diagram illustrating a mobile terminal according to the present invention. Each of the mobile terminals 1a to 1m, as shown in FIG. 2, comprises a RF (Radio Frequency) section 21 for transmitting/receiving wireless signals through an antenna; a data process section 23, connected to the RF section 21, for processing voice and data signals transmitted/received at the RF section 21; an audio process section 22 for processing voice signals outputted from the data process section 23; a key input section 24; a display section 27; a memory 28; and a control section 25 for controlling all operations of the mobile terminal. The key input section 24 includes number keys (0-9), specific keys such as '#" and "*", a voice-terminating key, a data-terminating key, and an 'end' key.

The memory 28 stores programs as follows: an application program for

supporting an interactive message communication; a stock application program for processing and displaying stock data; a plurality of application programs 33, 34 and 35 such as a multimedia application program for processing moving-picture data; and an application program starting section 32 for starting a pertinent application program when an application program starting message according to the present invention is received. The application program starting section 32 is a kind of control program for controlling starting of a plurality of application programs which are operated on the basis of a software 31 such as an operating system. The application program starting section 32 judges a pertinent application program by analyzing the kind of service which is included in a received application program starting message, and checks whether or not the pertinent application program capable of processing the service data exists in the memory 28. It is possible to configure the application program starting section 32 in a small size.

FIG. 3 is a view illustrating a software configuration for operating application programs stored in a mobile terminal according to the present invention. The application program starting section 32, as shown in FIG. 3, is operated on the basis of an operating software (OS: Operating System) stored in the memory 28 of a mobile terminal. The application program starting section 32 receives an application program starting message, analyzes the kind of service included in the application program starting message, and operates any one of a first, a second, and a third application program 33, 34, and 35.

According to the present invention, when receiving a call establishment signal through the RF section 21, the control section 25 of the mobile terminal lets its user know of termination by a ring and/or a vibration. At this state, when the user pushes a data-terminating key in the key input section 24, the control section 25 senses this, generates a traffic channel for transmitting/receiving data, and receives an application program starting message through the traffic channel.

When receiving an application program starting message 40 as shown in FIG. 4 described later, the control section 25 invokes a pertinent application program corresponding to the information about the kind of service, reads a pertinent IP address as information regarding of a service server included in the application program starting message, and performs a control to access the service server having the IP address read from the application program starting message.

FIG. 4 is a view illustrating a format of an application program starting message 40, which is used for a server to run an application program stored in a mobile terminal according to the present invention. As shown in FIG. 4, the application program starting message 40 includes a header 41, information about the kind of service 42, information of type of transmission data 43 such as a TCP (Transmission Control Protocol) or an UDP (User Datagram Protocol), information of an IP address of a service server 44, and information of a server access protocol 45 such as an HTTP (Hypertext Transfer Protocol) or a WAP (Wireless Application Protocol). In the header 41, information for judging whether or not a message received through a traffic channel is an application program starting message is stored. The information about the kind of service 42 is used to judge which application program is needed to process data which will be provided from an application program starting server. Herein, a mobile terminal operated on the basis of IMT-2000 has a function of receiving an HTTP document and directly processing the received HTTP document, without a document conversion process.

FIG. 5 is a control flowchart for explaining an application program starting method of mobile terminal according to the present invention. As shown in FIG. 5, a mobile terminal receives a call establishment request signal through a paging channel at step 101. When a call establishment is approved in such a manner that a user selects a data-terminating key in the key input section 24 of the mobile terminal at step 101, a traffic channel is generated by a data terminating function (step 102). Subsequently, an application program starting message is received through the traffic channel (step 103), and the kind of service is recognized by checking the application program starting message (step 104). At step 105, the control section 25 judges whether or not a pertinent application program capable of processing service data exists in the memory 28. If, as a result of the judgment at step 105, the pertinent application program exists in the memory 28, the control section 25 invokes the pertinent application program at step 106, and then proceeds step 107. At step 107, the control section 28 checks an IP address with the service server access information in the application program starting message, and proceeds to access a service server having the IP address, thereby receiving service data. Herein, the service data may be message data of a messenger server or advertisement data of an advertisement server. However, as a result of the judgment at step 105, if an application program capable of processing service data doesn't exist in the memory 28, the control section 25 transmits an absence message indicating that the application program doesn't exist to the application program starting

server 8 (step 108). Meanwhile, if the user selects the end key in the key input section 24 so as to end the connection to the service server (step 109), the control section 25 of the mobile terminal terminates the connection to the service server (step 110).

FIG. 6 is a flowchart for explaining an internal operation of an application program starting server 8 to invoke an application program of a mobile terminal according to a first embodiment of the present invention. As shown in FIG. 6, at step 200, an application program starting server 8 receives service data transmission request from a predetermined service provider server. At step 201, the application program starting server 8 recognizes the kind of service provided from the service provider server. If the service provider server is an advertisement server (step 202), the application program starting server 8 generates an application program starting message including a kind of service and access information to the advertisement server (step 203). At step 204, the application program starting server 8 transmits the application program starting message to a mobile terminal through a mobile communication network. Meanwhile, if the application program starting server 8 receives an absence message, which indicates that an application program capable of processing service data doesn't exist, from the mobile terminal (step 205), the application program starting server 8 transmits a download request message for the application program to the mobile terminal through the mobile communication network (step 206).

FIG. 7 is a flowchart for explaining an internal operation of an application program starting server to invoke an application program of a mobile terminal according to a second embodiment of the present invention. Hereinafter, the following embodiment will be described for a case wherein a service provider server is a messenger server, and a computer user wants to enact messenger communication with a predetermined mobile terminal in which the computer is an originating-part terminal connected to the messenger server. Herein, the messenger server and the application program starting server provide a messenger service function either between a mobile terminal and a computer or between one mobile terminal and another mobile terminal. To this end, the application program starting server has a database in which phone numbers of mobile terminals are stored with respectively corresponding messenger IDs.

As shown in FIG. 7, at step 300, the application program starting server receives data to request a conversation from a messenger server At step 301, the application program starting server extracts a phone number of an receiving-part mobile terminal to receive a message on the basis of the kind of service to be provided by the messenger server and the ID of the receiving-part mobile terminal provided by the

messenger server. At step 302, the application program starting server generates an application program starting message including the kind of service and access information of the messenger server. At step 303, the application program starting server transmits the application program starting message to the receiving-part mobile terminal through a mobile communication network so that the receiving-part mobile terminal connects to the application program starting server. Next, when receiving a message transmitted from the mobile terminal through the mobile communication network, the application program starting server converts the received message to an ID corresponding to a phone number of the mobile terminal (step 304), and then transmits the ID together with the message to the messenger server, so that they are transmitted to the originating-part computer (step 305). Meanwhile, if the application program starting server receives an absence message indicating that a pertinent application program doesn't exist from the mobile terminal (step 306), the application program starting server 8 a download request message for a pertinent application program to the mobile terminal through the mobile communication network (step 307).

Therefore, when the application program starting server 8 transmits an application program starting message to a receiving-part mobile terminal through a traffic channel having been formed when data are terminated to a mobile terminal having a data terminating function, the receiving-part mobile terminal automatically invokes an application program capable of processing data provided from a service server, thereby being connected to a pertinent service server. As a result of this, it is possible that the service server transmits data – such as advertisement data, message data, and so forth – to a mobile terminal.

[PATENT CLAIMS]

1. A method of starting an application program of a mobile terminal having a data terminating function, the method comprising the steps of:

receiving a call establishment request for data termination;

establishing a data call according to the call establishment request;

checking the kind of service included in an application program starting message, when the application program starting message is received after the call is established; and

automatically starting an application program corresponding to the confirmed kind of service.

2. A method of starting an application program of a mobile terminal as claimed in claim 1, wherein establishment of the data call is performed when a data terminating function is selected.

3. A method of starting an application program of a mobile terminal as claimed in claim 1, further comprising a step of examining whether or not an application program corresponding to the kind of service included in the application program starting message exists.

4. A method of starting an application program of a mobile terminal as claimed in claim 3, wherein the application program starting message includes a header for judging whether or not a received message is an application program starting message, information about the kind of service, information of type of transmission data, information of service access, and information about service access protocol.

5. A method of starting an application program of a mobile terminal as claimed in claim 1, wherein the application program starting message is received through a traffic channel formed according to establishment of the data call.

6. A method of starting an application program of a mobile terminal as claimed in claim 5, wherein the invoked application program tries to access an application program starting server.

7. A method of starting an application program of a mobile terminal as claimed in claim 2, further comprising the steps of:

originating a service denial message when a pertinent application program corresponding to the application program starting message doesn't exist; and

ending the call connection.

8. A method of providing service data to a mobile terminal in a mobile communication system, the mobile terminal having a data terminating function, the method comprising the steps of:

receiving a request for data transmission to the mobile terminal from at least one service server;

generating an application program starting message for running one of at least one application program stored in the mobile terminal on the basis of the kind of service data to be provided from the service server;

transmitting a call establishment signal to the mobile terminal, the call establishment signal requesting data termination being for the transmission of the generated application program starting message;

transmitting the application program starting message to the mobile terminal through a traffic channel, the traffic channel being formed upon the selection of data termination at the mobile terminal; and

the mobile terminal receiving service data of the service server by connecting with the service server.

9. A method of providing service data in a mobile communication system as claimed in claim 8, wherein, the service server includes a stock server in which stock data are stored and an advertisement server in which advertisement data are stored.

10. A method of providing service data in a mobile communication system as claimed in claim 9, wherein, the service server includes a stock server in which stock data are stored and an advertisement server in which advertisement data are stored.

11. A method of providing service data in a mobile communication system as claimed in claim 10, wherein the service server includes a messenger server for providing an instant message service.

12. A method of providing service data in a mobile communication system as claimed in claim 11, further comprising the steps of:

receiving an absence signal, which indicates that an application program doesn't exist, from the mobile terminal; and

transmitting a download request message for the application program to the mobile terminal.

13. A method of starting an application program of a mobile terminal having a data terminating function, the method comprising the steps of:

receiving a call establishment request for data termination;

establishing a data call according to the call establishment request; and

automatically starting an application program corresponding to the kind of service included in the call establishment request.

14, A method of starting an application program of a mobile terminal as claimed in claim 13, wherein establishment of the data call is performed when a data terminating function is selected.

15. A method of starting an application program of a mobile terminal as claimed in claim 14, further comprising a step of examining whether or not an application program corresponding to the kind of service included in the call establishment request exists.

16. A method of starting an application program of a mobile terminal as claimed in claim 15, wherein the call establishment request includes information about the kind of service, information of type of transmission data, information of service access, and information about service access protocol.

17. A method of starting an application program of a mobile terminal as claimed in claim 16, wherein the invoked application program tries to access an application program starting server.

18. A method of starting an application program of a mobile terminal as claimed in claim 16, further comprising the steps of:

originating a service denial message when a pertinent application program corresponding to the call establishment request doesn't exist; and

ending the call connection.

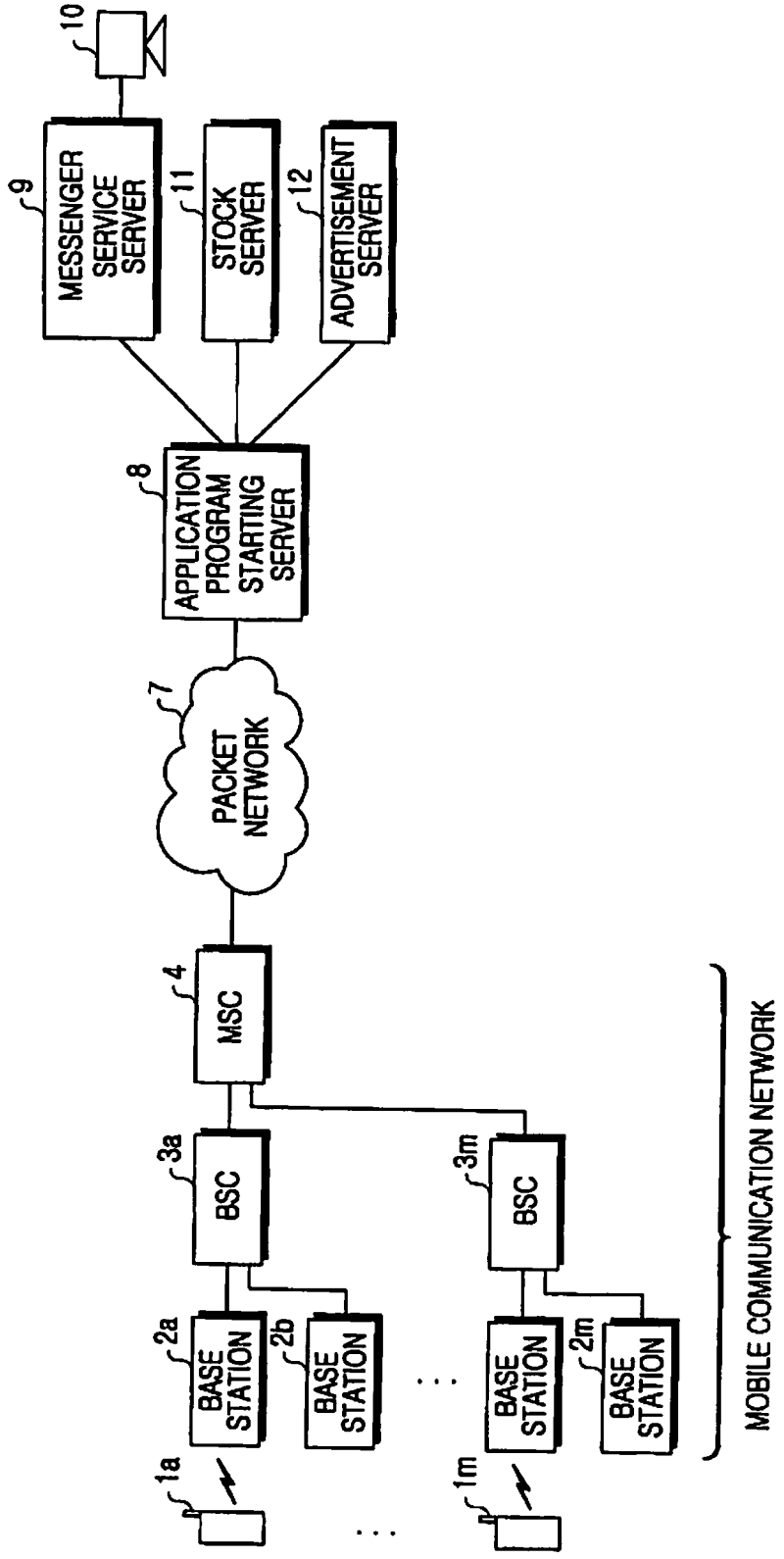
10
9
MESSENGER SERVICE SERVER
11
STOCK SERVER
12
ADVERTISEMENT SERVER
8
APPLICATION PROGRAM STARTING SERVER
7
PACKET NETWORK
4
MSC
3a
BSC
3m
BSC
2a
BASE STATION
2b
BASE STATION
2m
BASE STATION
1a
1m
MOBILE COMMUNICATION NETWORK

FIG. 1

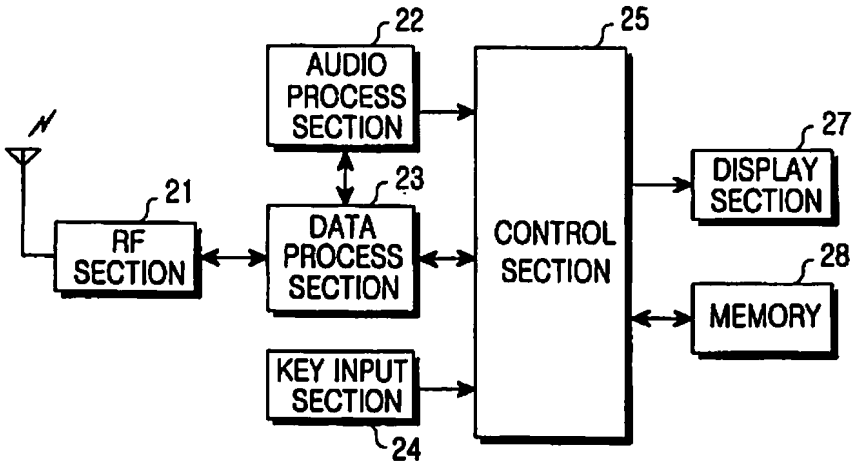
22
AUDIO PROCESS SECTION
25
27
DISPLAY SECTION
21
RF SECTION
23
DATA PROCESS SECTION
CONTROL SECTION
28
MEMORY
KEY INPUT SECTION
24

FIG.2

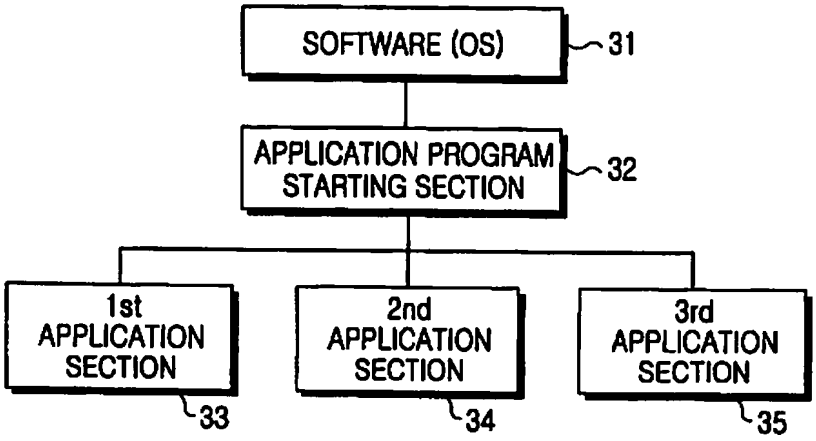
SOFTWARE (OS)
31
APPLICATION PROGRAM STARTING SECTION
32
1st APPLICATION SECTION
33
2nd APPLICATION SECTION
34
3rd APPLICATION SECTION
35

FIG.3

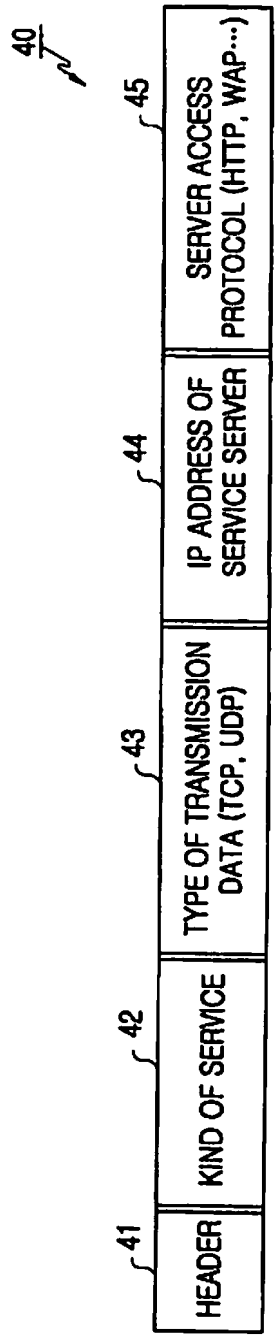
40
41
HEADER
42
KIND OF SERVICE
43
TYPE OF TRANSMISSION DATA (TCP, UDP)
44
IP ADDRESS OF SERVICE SERVER
45
SERVER ACCESS PROTOCOL (HTTP, WAP···)

FIG.4

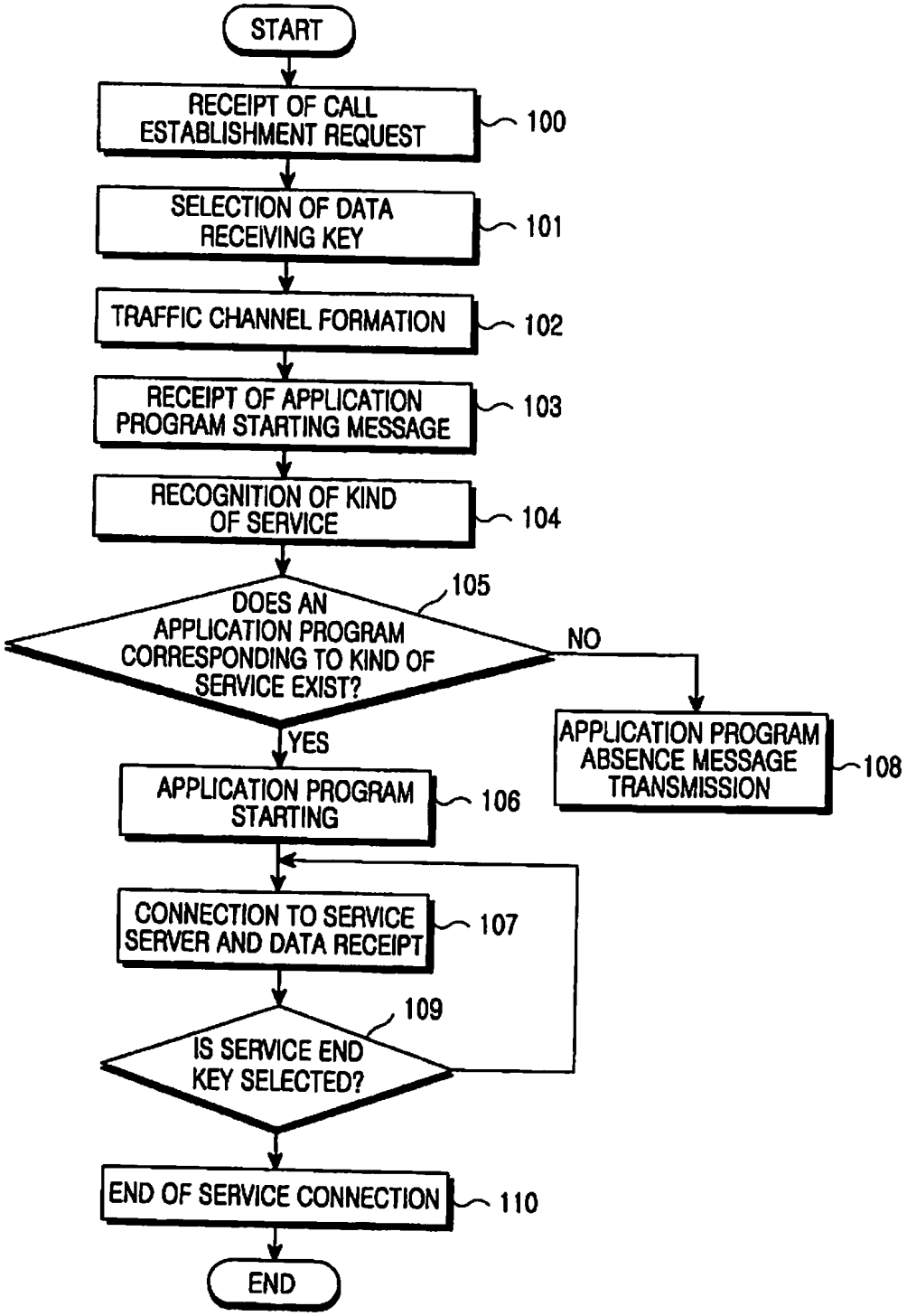
START
RECEIPT OF CALL ESTABLISHMENT REQUEST
100
SELECTION OF DATA RECEIVING KEY
101
TRAFFIC CHANNEL FORMATION
102
RECEIPT OF APPLICATION PROGRAM STARTING MESSAGE
103
RECOGNITION OF KIND OF SERVICE
104
105
DOES AN APPLICATION PROGRAM CORRESPONDING TO KIND OF SERVICE EXIST?
NO
YES
APPLICATION PROGRAM ABSENCE MESSAGE TRANSMISSION
108
APPLICATION PROGRAM STARTING
106
CONNECTION TO SERVICE SERVER AND DATA RECEIPT
107
109
IS SERVICE END KEY SELECTED?
END OF SERVICE CONNECTION
110
END

FIG.5

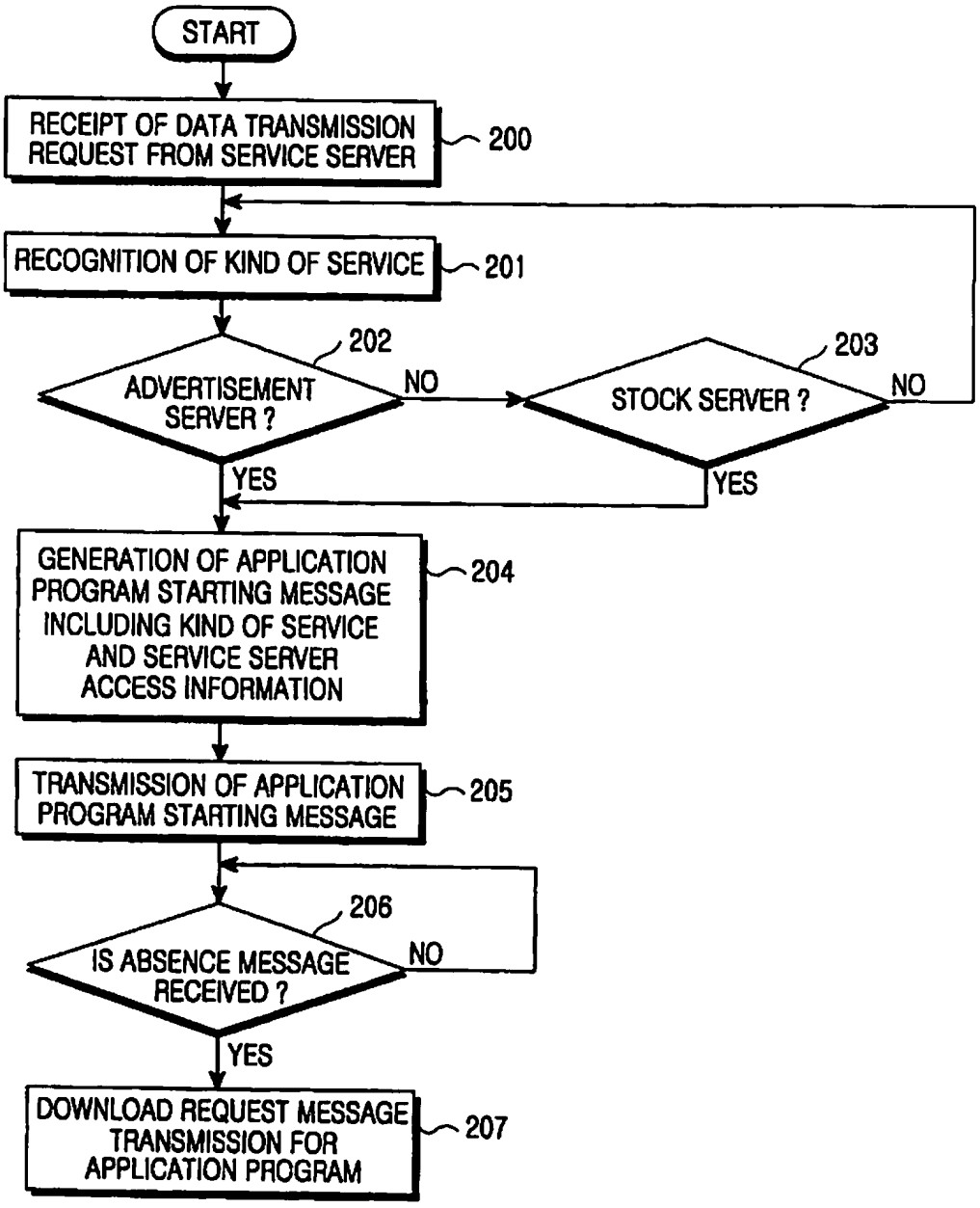
START
RECEIPT OF DATA TRANSMISSION REQUEST FROM SERVICE SERVER
200
RECOGNITION OF KIND OF SERVICE
201
202
ADVERTISEMENT SERVER ?
NO
203
STOCK SERVER ?
NO
YES
YES
GENERATION OF APPLICATION PROGRAM STARTING MESSAGE INCLUDING KIND OF SERVICE AND SERVICE SERVER ACCESS INFORMATION
204
TRANSMISSION OF APPLICATION PROGRAM STARTING MESSAGE
205
206
IS ABSENCE MESSAGE RECEIVED ?
NO
YES
DOWNLOAD REQUEST MESSAGE TRANSMISSION FOR APPLICATION PROGRAM
207

FIG.6

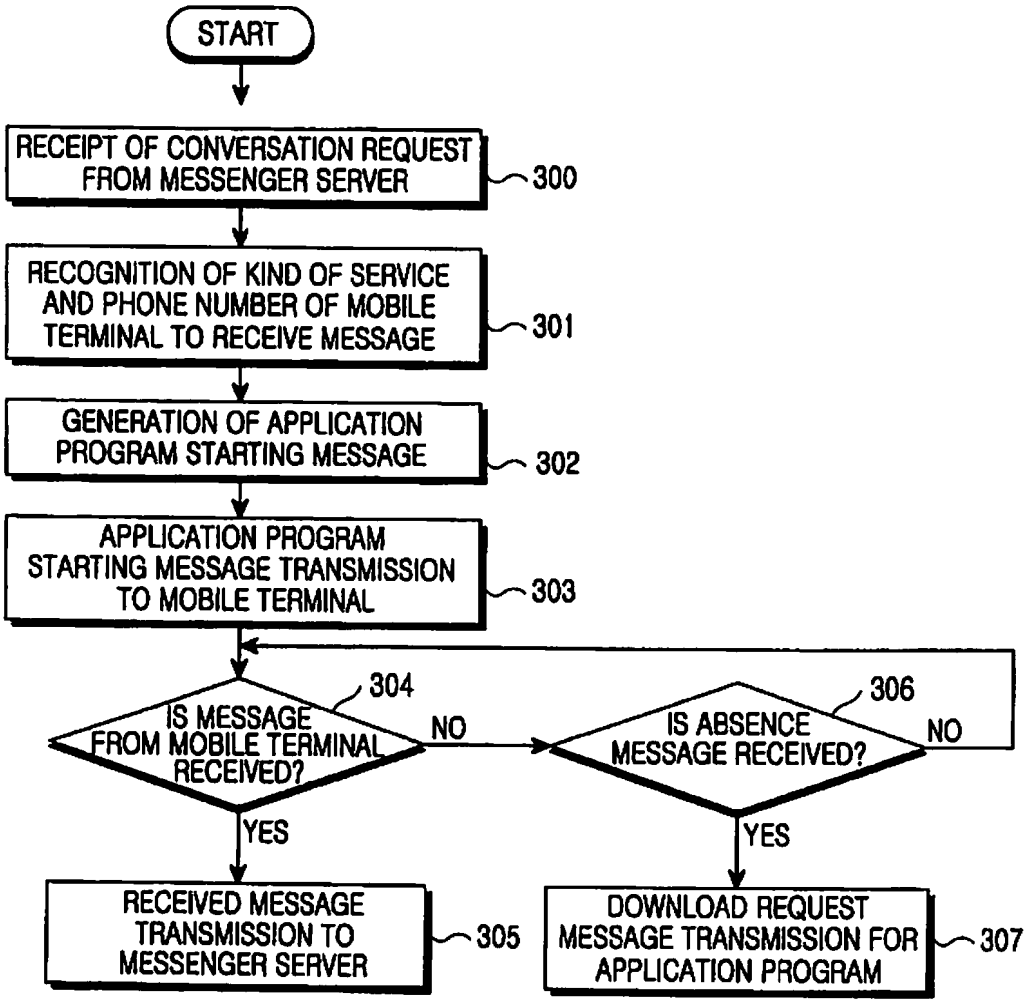
START
RECEIPT OF CONVERSATION REQUEST FROM MESSENGER SERVER
300
RECOGNITION OF KIND OF SERVICE AND PHONE NUMBER OF MOBILE TERMINAL TO RECEIVE MESSAGE
301
GENERATION OF APPLICATION PROGRAM STARTING MESSAGE
302
APPLICATION PROGRAM STARTING MESSAGE TRANSMISSION TO MOBILE TERMINAL
303
304
IS MESSAGE FROM MOBILE TERMINAL RECEIVED?
NO
306
IS ABSENCE MESSAGE RECEIVED?
NO
YES
YES
RECEIVED MESSAGE TRANSMISSION TO MESSENGER SERVER
305
DOWNLOAD REQUEST MESSAGE TRANSMISSION FOR APPLICATION PROGRAM
307

FIG.7